The Impact of Credit Risk Analysis Practices on Risk Management in Indian Commercial Banks: An Empirical Investigation

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ABSTRACT

Banking industry has witnessed dramatic changes globally in the past two decades. Banks in today's scenario are not only moving towards effectiveness, but also towards excellence. Not only profile of the banking sector but also the nature of risk management in banks has changed dramatically. Size and functions of banks have increased tremendously and have become varied and complex. In order to meet the competition, banks are offering innovative products and computerizing their offices so as to improve speed of their operations. The expanded role of banks has given rise to various risk exposures. Market forces are also influencing the banking sector and this has further accentuated the risk element. Undoubtedly all banks in the present-day volatile environment are facing a large number of risks which may threaten a bank's survival and success. Hence, there lies an imperative need for the banks to address various risk elements and enhance risk management practices. This research paper aim to examine the impact of credit risk analysis practices on risk management of Indian banks. The study has been conducted by statistically analysis the views of employees of various banks.

Keywords: Risk, Risk Management, Risk Management Practices, Credit Risk Analysis, Banks.

INTRODUCTION

Risk management may be defined as any set of actions taken by individuals or corporations in an effort to alter the risk arising from their preliminary lines of business (Cummins et. al. 1998). Feridun (2006) on the other hand described risk management as a process of measuring, or assessing risk and then developing strategies to manage the risk. In general, the strategies employed include transferring the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accepting some or all of the consequences of a particular

risk. BCBS (2001) defines financial risk management as a sequence of four processes: (1) the identification of events into one or more broad categories of market, credit, operational and other risks into specific sub-categories; (2) the assessment of risks using data and risk model; (3) the monitoring and reporting of the risk assessments on a timely basis; and (4) the control of these risks by senior management.

The prime reason to adopt risk management practices is to avoid the probable failure in future. Risk management practices adopted by the banks might be considered the most important aspect of risk management. The risk management strategy must be integrated with overall corporate strategies (e.g. Froot and Stein, 1993). Risk management is expensive as it requires resources and institutional disruption. But the cost of delaying or avoiding proper risk management can lead to some adverse results, like failure of a bank and possibly failure of a banking system (Meyer, 2000). Hence, there lies an imperative need for the banks to address various risk management practices. The role of market forces are influencing the banking sector and increasing the element of risk. The banks need to follow internationally compatible prudential norms and sound banking operation system involving minimum risk exposure.

In order to enhance risk management system globally, the Basel Committee on Banking Supervision was formed which aimed at providing a forum for regular cooperation on banking supervisory matters. Its objective was to enhance understanding of key supervisory issues and to improve the quality of banking supervision worldwide. In this regard, the initial capital accord of 1988 was formed, which was simple and brought in uniformity and attempted to make regulatory capital requirement consistent with the economic capital. Reserve Bank of India introduced risk assets ratio system as a capital adequacy measure in 1992, in line with the Basel accord of 1988. However, this accord was criticized as being inflexible due to its focus on primarily credit risk and treating all types of borrowers under one risk category regardless of credit worthiness (Sinha, 2011).

The Basel Committee on Banking Supervision thought it desirable that the BASEL accord to be replaced by a more risk-sensitive framework and BASEL II accord was formed. The new Basel Capital Accord, also known as "Basel II", was an update of "The 1988 Accord", which was adopted by more than 100 countries worldwide. The new Basel II regulations put forward by the Basel Committee on Banking Supervision aimed at improving the safety and soundness of the financial system by aligning capital adequacy assessment more closely with the underlying risks in the banking industry, providing a thorough supervisory review process, and enhancing market discipline. They further seek to maintain the current overall level of capital in the system and enhance competitive equality (Feridun, 2006).

Gupta and Srinivasan (2005) identified that implementation of Basel II is likely to improve the risk management systems of banks in India as the banks aim for adequate capitalization to meet the underlying credit risks and strengthen the overall financial system of the country. In India, the proposed deadline for implementing Basel II was March 31, 2007 which was later extended. Later it was suggested that foreign banks in India and Indian banks operating abroad were required to implement Standardized approach for credit risk and basic Indicator approach for operational risk with effect from March 31, 2008 and all other scheduled commercial banks were required to adhere the guidelines by March 31, 2009 (Alagiri, 2008). By the end-March 2009, all Indian scheduled commercial banks had migrated to the simpler approaches available under the Basel II framework. The time schedule for implementation of advanced approaches under Basel II was notified and an inter-disciplinary Financial Stability Unit was set up to monitor and address systemic vulnerabilities.

Credit risk in commercial banks represents the most important type of risk. Banks bear the credit risk attached to bank loans and forward contracts. The risk of defaults or protracted arrears on outstanding loan is termed as credit risk (Al-Tamimi, H. and Al- Mazrooei, F., 2007). According to the consultative paper issued by the Basel Committee on Banking Supervision (1999), for most bank loans are the largest and most obvious sources of credit risk. It mainly arises from the potential that a borrower or counterparty will fail to perform an obligation. It may arise from either an inability or an unwillingness to perform in the pre-committed contracted manner. Credit problems, especially weakness in credit risk management have been identified to be a part of the major reasons behind banking difficulties. Brown Bridge (1998) observed that these problems are at their acute stage in developing countries.

The problem often begins right at the loan application stage (Liukisila, 1996) and increases further at the loan approval, monitoring and controlling stages, especially when Credit Risk Management guidelines in terms of policy and strategies/procedures for credit processing do not exist or are weak or incomplete. There is a need for Strategic approach to Credit Risk Management in Indian Commercial Banks, in view of Higher Non Performing Assets level in comparison with global benchmark. (McKinley and Berrickman, 1994; Arunkumar and Kotreswar, 2003). Credit Risk analysis are considered important in developing risk management practices in banks. Therefore, the main objective of this study is to examine the relationships between Credit Risk analysis and risk management practices in banks. Specifically credit risk analysis consists of Credit Worthiness Analysis and Collateral Requirements (Arora, 2013).This study attempts to examine the influence of two dimensions of credit risk analysis on risk management practices of banks.

CREDIT WORTHINESS ANALYSIS

Credit risk analysis represents specific and overall analysis of clients in respect of loan granted to them so as to reduce credit risk. It includes analyzing client's characters, capacity, collateral, capital and conditions before granting loans and classifying borrowers according to risk factor (Arora, 2013). Previous studies indicate that first step to manage credit risk is analyzing credit worthiness of clients before granting loans. In this regard, Rajagopal (1996) made an attempt to overview the bank's risk management and suggested a model for pricing the products based on credit risk assessment of the borrowers. He concluded that good risk management is good banking, which ultimately leads to profitable survival of the institution. Nandi, J. and Choudhary, N. (2011) developed an internal credit rating model for banks which improves their current predictive power of financial risk factors. It also studied how banks assess the creditworthiness of their borrowers and how can they identify the potential defaulters so as to improve their credit evaluation.

Screening borrowers is an activity that has widely been recommended by, among others, Derban et al. (2005). The recommendation has been widely put to use in the banking sector in the form of credit assessment. According to the asymmetric information theory, a collection of reliable information from prospective borrowers becomes critical in accomplishing effective screening. The assessment of borrowers can be performed through the use of qualitative as well as quantitative techniques. One major challenge of using qualitative models is their subjective nature (Bryant, 1999; Chijoriga, 1997).Clear established process for approving new credits and extending the existing credits has been observed to be very important while managing Credit Risk (Heffernan, 1996). Further, monitoring of borrowers is very important as current and potential exposures change with both the passage of time and the movements in the underlying variables (Donaldson, 1994; Mwisho, 2001), and also are very important in dealing with moral hazard problem (Derban et al., 2005). Hence, borrowers need to be screened by analyzing the client's characters, capacity, collateral capital and conditions.

Monitoring is a continuous process and as a strategy credit granted to defaulted clients must be reduced in order to reduce credit risk. Monitoring involves, among others, frequent contact with borrowers, creating an environment that the bank can be seen as a solver of problems and trusted adviser; develop the culture of being supportive to borrowers whenever they are recognized to be in difficulties and are striving to deal with the situation; monitoring the flow of borrower's business through the bank's account; regular review of the borrower's

reports as well as an on-site visit; updating borrowers credit files and periodically reviewing the borrowers rating assigned at the time the credit was granted (Donaldson, 1994; Basel, 1999; Mwisho, 2001). Earlier work has focused on internal credit rating as a "core business" of a bank (Brunner et al., 2000). The above studies reveal that analyzing client's characters, capacity, collateral, capital and conditions before granting loans and classifying borrowers according to risk factor is crucial for developing risk management practices of bank. As such, it is hypothesized that:

H_{A1}: There is a significant and positive influence of Credit Worthiness Analysis on Risk Management Practices

COLLATERAL REQUIREMENTS

Collateral requirements represents guarantee against the loan granted so as to reduce credit risk (Arora, 2013). Bagehot (1873) identified that in order to avert panic, central banks should lend early and freely to solvent firms, against good collateral and at high rates. Breeden, S. (2010) studied policies of Bank of England during financial crisis and focused on expanded range of collateral accepted by them in its market operations to include private sector assets, notably asset-backed securities and covered bonds. They further explored how the Bank of England undertakes collateral risk management, highlighting in particular the significant degree of protection taken by the Bank in its operations.

Bindseil, U. and Papadia, F. (2006) reviewed the role and effects of the collateral frameworks which central banks, and in particular the Euro system, uses in conducting temporary monetary policy operations. They explained the design of such a framework from the perspective of risk mitigation, which is the purpose of collateralization. They identified that by means of appropriate risk mitigation measures, the residual risk on any potentially eligible asset can be equalized and brought down to the level consistent with the risk tolerance of the central bank. Once this result has been achieved, eligibility decisions should be based on an economic cost-benefit analysis. They also looked at the effects of the collateral framework on financial markets, and in particular on spreads between eligible and ineligible assets. Hence, this study purports that:

H_{A2}: There is a significant and positive impact of Collateral requirements on Risk Management Practices.

RESEARCH METHODOLOGY

Scope and Design of the Study

The present study is undertaken primarily to examine the impact of credit risk analysis practices of banks on Risk management practices of Schedule Commercial Banks (SCBs) in India. It is based on primary data that was collected from sample of 200 employees of public and private sector banks of Indore division. 50 respondents were chosen from each bank viz SBI and Associates; Other Nationalized Banks; Old Private Sector banks and New Private Sector Banks. The respondents were selected through non-probability convenience (judgmental) sampling method. As this research has a quantitative base so questionnaire used in this research is close ended questionnaire. The research instrument used to collect data was based on questionnaire developed by Al-Tamimi and Al-Mazrooei (2007). Respondents were asked to indicate their degree of agreement with each of the questions on a five-point Likert scale. Using structured questionnaire face-to-face interviews with bank's officials and other persons connected with risk management operations was conducted.

Instrumentation and Sample Items

A total of 17 items with five-point Likert scale were used to measure all variables in the study. Risk management practices were measured by ten close-ended questions based on questionnaire developed by Al-Tamimi and Al-Mazrooei (2007). Sample items were "The bank's executive management regularly reviews the organization's performance in managing its business risks", "I believe that this bank has highly effective continuous review/feedback on risk management strategies and performance", "The bank's risk management procedures and processes are documented and provide guidance to staff about managing risks", "I believe that bank's policy encourages training programs on the area of risk management", "This bank emphasizes the recruitment of highly qualified people in risk management", "Efficient risk management is one of the bank's objectives", "I believe that it is too dangerous to concentrate bank's funds in one specific sector of the economy", "I believe that the application of Basel capital Accord by the bank would improve the efficiency of risk management", "Bank's capital is adequate if the ratio of capital to total risk-weighted assets is equal to 10 percent", "Overall I consider the level of risk management practices of this bank to be excellent".

Creditworthiness analysis was measured using four close-ended questions based on questionnaire developed by Al-Tamimi and Al-Mazrooei (2007), its items were "Before granting loans your bank undertake a specific analysis including the client's characters, capacity, collateral capital and conditions", "This bank undertakes a credit worthiness analysis before granting loans", "This banks' borrowers are classified according to a risk factor (risk rating)", "The level of credit granted to defaulted clients must be reduced" and collateral requirements was measured using three close-ended questions based on questionnaire developed by Al-Tamimi and Al-Mazrooei (2007), its items were "It is essential to require sufficient collateral from the small borrowers", "This bank's policy requires collateral for all granting loans" and "It is preferable to require collateral against some loans and not all of them".

Tools for Data Analysis

The genesis of the different questions incorporated in this questionnaire was to bring out and analyze impact of credit risk analysis practices on risk management practices adopted by the banks. The data were analyzed using window based Statistical package of the Social Science (SPSS). The statistical tools used were Linear regression, correlation and mean to analyze the data.

Item Total Correlation and Reliability of the Measures

Questionnaire adopted in this study consisted of seventeen questions. As the sample size was 200, item with correlation value less than 0.1948 should be dropped. All the items in the study had correlation values more than 0.1948 thus; no item was dropped from the questionnaire. Reliability of the measures was assessed with the use of Cronbach's alpha on all the four items for creditworthiness analysis, three items for collateral requirements and ten items for Risk management practices. Cronbach's alpha allows us to measure the reliability of different variables. It consists of estimates of how much variation in scores of different variables is attributable to chance or random errors (Selltiz et al., 1976). As a general rule, a coefficient greater than or equal to 0.7 is considered acceptable and a good indication of construct reliability (Nunnally, 1978). The Cronbach's alpha for the creditworthiness analysis was 0.823, collateral requirements was 0.798 and risk management practices questionnaire was 0.787. Hence, it was found reliable for further analysis.

Research Framework

The research framework in this study is built upon the literature review. It is therefore theorized that each dimension in Credit Risk Analysis has an influence on Risk Management Practices of Banks. Figure I depicts the research framework of this study.

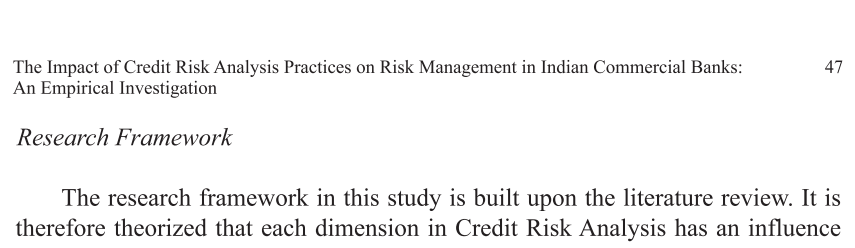

Figure I: Research Framework

Result and Discussion

The present investigation is a quantitative research to understand the effect of credit risk analysis on risk management practices. Risk management practices are categorized as dependent variables and dimensions of credit risk analysis i.e. Credit Worthiness Analysis and Collateral Requirements are categorized as independent or explanatory variables. In order to test H_{A1} and H_{A2}, the following regression model is used to estimate the relationship between Risk Management Practices and the two explanatory variables as follows:

RMP = *f* (CWA and CR)
Where:
RMP = Risk management practices;
CWA= Credit Worthiness Analysis
CR= Collateral Requirements

This model is adopted to test the second hypothesis of the study. The model is checked by Multiple Regression Method. Another tool used to determine whether a linear relationship exists between the variables is Pearson's Correlation, r. Pearson correlation is used to analyze correlations among the explanatory variables, namely Credit Worthiness Analysis (CWA) and Collateral Requirements (CR). Table I reveals the correlation coefficients between all the

variables. This table of bi-correlations is useful to detect any potential case of multicollinearity. The "rule of thumb" test suggested by Anderson et al. (1990) states that any correlation coefficient exceeding (0.7) indicates a potential problem. An examination of the results of correlations presented in Table I suggests that there is no problem of multicollinearity among all explanatory variables.

Table I: Correlation Coefficients between Explanatory Variables

	CWA	CR
CWA	1	
CR	0.316*	1

* Correlation is significant at the 0.05 level (2-tailed)

Table II depicts the regression results. It can be seen from the results provided in Table II that R2 is 1.000. This indicates that the two explanatory variables explain 100 percent of the variations in risk management practices.

Table II: Model Summary for all explanatory variables

Model	R	R^2	Adjusted R^2	F	Sig
1.	1.000(a)	1.000	1.000	1.656	0.000

Predictors: (Constant), CWA, CR * Significant at α =1%

Table III shows the results of multiple-regression model which depicts that the estimated coefficients of CWA and CR are significant (F= 1.656, p< 0.01). Therefore, H_{A1} and H_{A2} are accepted, which reflects that credit worthiness analysis and collateral requirement show positive impact on risk management practices.

Table III: OLS Regression Result for all Explanatory Variables Coefficients (a)

	Beta	t	Sig.
Constant	0.006	7.146	
CWA	0.249	1.183	0.000*
CR	0.750	4.971	0.000*

a. Dependent Variable: RMP * Significant at α = 1%

Collateral requirement was found to be the most important aspect for Risk Management Practices since the beta value (regression coefficients) was found to be 0.750. Credit worthiness Analysis was also found to be important aspect of Risk management practices with beta value of 0.249. The strength and direction

of the beta coefficients (regression coefficients) suggest that the more efficient Collateral requirement and Credit worthiness Analysis are; the better will be Risk management practices.

The primary objective of this study was to examine the impact of credit risk analysis practices (credit worthiness analysis and collateral requirements) on risk management practices in scheduled commercial banks in India. The result of this study indicated that credit worthiness analysis and collateral requirement show positive impact on risk management practices. The findings are incongruent to the results of some past researches. There are many conceptual studies that shows the important aspects of risk management process that firms need to have in order to practice risk management (e.g. Tchankova 2002; Barton et al, 2002; Pausenberger and Nassauer, 2005). Some empirical findings (e.g. Al- Tamimi and Al-Mazrooei, 2007) show positive relationships between risk management practices and the various aspects of risk management process, and some findings (e.g. Boston Consulting Group, 2001; Al-Tamimi, 2002; KPMG, 2003; Parrenas, 2005; Al-Tamimi and Al-Mazrooei, 2007) show the important aspect of risk management practices by various financial institutions.

Various researchers have studied reasons behind bank problems and identified several factors (Santomero, 1997; Basel, 1999, Basel, 2004). Al-Tamimi (2002) investigated the degree to which the UAE commercial banks use risks management techniques in dealing with different types of risk. The study found that the UAE commercial banks were mainly facing credit risk. The main techniques used in risk management according to this study were establishing standards, credit score, credit worthiness analysis, risk rating and collateral; the study also highlighted the willingness of the UAE commercial banks to use the most sophisticated risk management techniques, and recommended the adoption of a conservative credit policy. Arora and Jain (2012) identified that Understanding Risk Management, Risk Monitoring and Credit Risk Analysis were the most important aspects or the most influencing aspects in Risk Management Practices of Indian Banks.

Hassan, A. (2009) assessed the degree to which the Islamic banks in Brunei Darussalam implemented risk management practices and carried them out thoroughly by using different techniques to deal with various kinds of risks. The results of the study showed that, like the conventional banking system, Islamic banking was also subjected to a variety of risks due to the unique range of offered products in addition to conventional products. The major risks that were faced by these banks were Foreign exchange risk, credit risk and operating risk. Al-Tamimi, H. and Al-Mazrooei, F. (2007) examined the degree to which the UAE

banks use risk management practices and techniques in dealing with different types of risk. They also compared risk management practices between the two sets of banks they found that the three most important types of risk facing the UAE commercial banks are foreign exchange risk, followed by credit risk, then operating risk.

Arora, S.; Chatterjee, A. and Hyde, A. (2007) evaluated quality of credit risk management system employed by Public and Private sector banks in India. They found that Credit risk management systems of Indian Public & private sector banks vary. They offered some suggestions to improve the credit risk management system by banks. Powell et. al. (2004) analyzed how data in public credit registries can be used to strengthen bank supervision and to improve the quality of credit analysis by financial institutions. The study was performed in central banks of Argentina, Brazil and Mexico. The results of the empirical tests explored that credit analysis enhances credit risk for capital and provisioning requirements and acts as a check on a bank's internal ratings for the Basel II's internal rating-based approach. Literature has found evidence of convergence among different types of Indian banks in terms of financial performance (Bhaumik and Dimova, 2004).

Bindseil, U. and Papadia, F. (2006) reviewed the role and effects of the collateral frameworks which central banks, and in particular the Euro system, use in conducting temporary monetary policy operations. They identified that by means of appropriate risk mitigation measures, the residual risk on any potentially eligible asset can be equalized and brought down to the level consistent with the risk tolerance of the central bank. Jayadev (2006) identified a set of actions to improve the quality of internal rating models of Indian banks by analyzing internal credit rating practices of Indian banks. The survey revealed that the components of internal rating systems, their architecture, and operation differ substantially across banks. The range of grades and risks associated with each grade also varied across the banks analyzed which implied that lending decisions may vary across banks. There were differences among the rating systems of various banks.

A body of literature on consumer lending has shown that asymmetric information may prevent the efficient allocation of lending, resulting in credit rationing (Jaffee and Russell, 1976; Stiglitz and Weiss, 1981). According to these literature, because of the existence of informational asymmetries, lenders fail to observe some relevant characteristics of potential borrowers and have no way of learning about them. Were full information available, the volume and distribution of lending would doubtless be very different from the outcome under asymmetric information (deMeza and Webb, 2000). Several risk-adjusted performance measures have been proposed (Heffernan, 1996; Kealhofer, 2003). Altman (2002)

analyzed that more emphasis is given to new developments and techniques for analytical treatment of credit risk management. Information sharing through credit bureaus is important for a number of reasons: it may increase the degree of competitiveness within credit markets, improve efficiency in the allocation of credit, and increase the volume of lending (Vives, 1990).

Credit scoring is the process of assigning a single quantitative measure or score to a potential borrower, representing an estimate of the borrower's future loan performance (Feldman, 1997). Ferguson (2001) analyzed the models and judgments related to credit risk management. The author concluded that proper risk modeling provides a formal systematic and disciplined way for firms to measure changes in the riskiness of their portfolio and help them in designing proper strategic framework for managing changes in their risk. Mitchell and Roy (2007) have used Altman Z-Score model in ranking the firms and in the design of internal rating systems. They have also investigated whether some models are better in differentiating defaulting and non-defaulting firms, the extent to which different failure prediction models may yield significantly different rankings for the same firm.

Bandyopadhyay (2006) aimed at developing an early warning signal model for predicting corporate default in emerging market economy like India. He also presented the method for directly estimating probability of default using financial and non-financial variable. The author concluded that by using 'Z' score model, banks and investors in emerging markets like India can get early warning signals about the firm's solvency status and reassess the magnitude of default premium they require on low grade securities. The PD estimate from logistic analysis would help banks to estimate credit risk capital and set corporate pricing on a risk adjusted return basis. This model has high classification power of sample and high prediction power in terms of its ability to detect bad firm in sample.

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Theoretically, this study has provided some empirical evidence on the relationship between credit risk practices and risk management practices of scheduled commercial banks in India. Conceptually it has been identified that Credit Worthiness analysis and Collateral requirements are the two important aspects in Credit Risk Management System in Indian Banks which in turn affect the Risk management practices of bank. Descriptive and analytical results have explained the relationships between risk management practices and the aspects of

Credit risk management. The result of this study has also added to the literature on credit risk analysis and risk management practices. In terms of practical contribution, the research results validated the notion that credit worthiness analysis and collateral requirements are of utmost importance in enhancing risk management practices of banks. Practically put, Credit Worthiness analysis and Collateral requirements were the most important aspects in Risk Management Practices, which mean that Indian Banks need to give more attention to these aspects of credit Risk management.

The body of knowledge generated through the results of this study can be applied as this work can become a base for designing Risk management practices in Banks. This study has paved several directions for future studies. Specifically, future research should replicate the framework of this study across the boundaries. Future studies should consider incorporating other predictors of risk management practices. This is because risk management practices is attributed to many aspects, not limited to credit risk analysis practices only. As a conclusion, the research results have provided support for the key propositions. Most importantly, this study has succeeded in answering all of the research objectives, which aimed at analyzing the empirical link between credit risk analysis practices (i.e. Credit Worthiness analysis and Collateral requirements) and risk management practices of banks. Thus, the present study relates to achieving efficient Risk Management practices in Indian Banks. It reveals more important, deeper and real dynamic operations in understanding and achieving efficient Risk Management practices in banks.

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